

Visualizing Pavement Management Data at the Project Level

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Outline

- Considerations in Data Visualization and Software Development
- Pavement Management: Decisions and Data
- Segment Viewer: Interactive Straight Line Diagram
- Segment Viewer Examples
- Conclusion

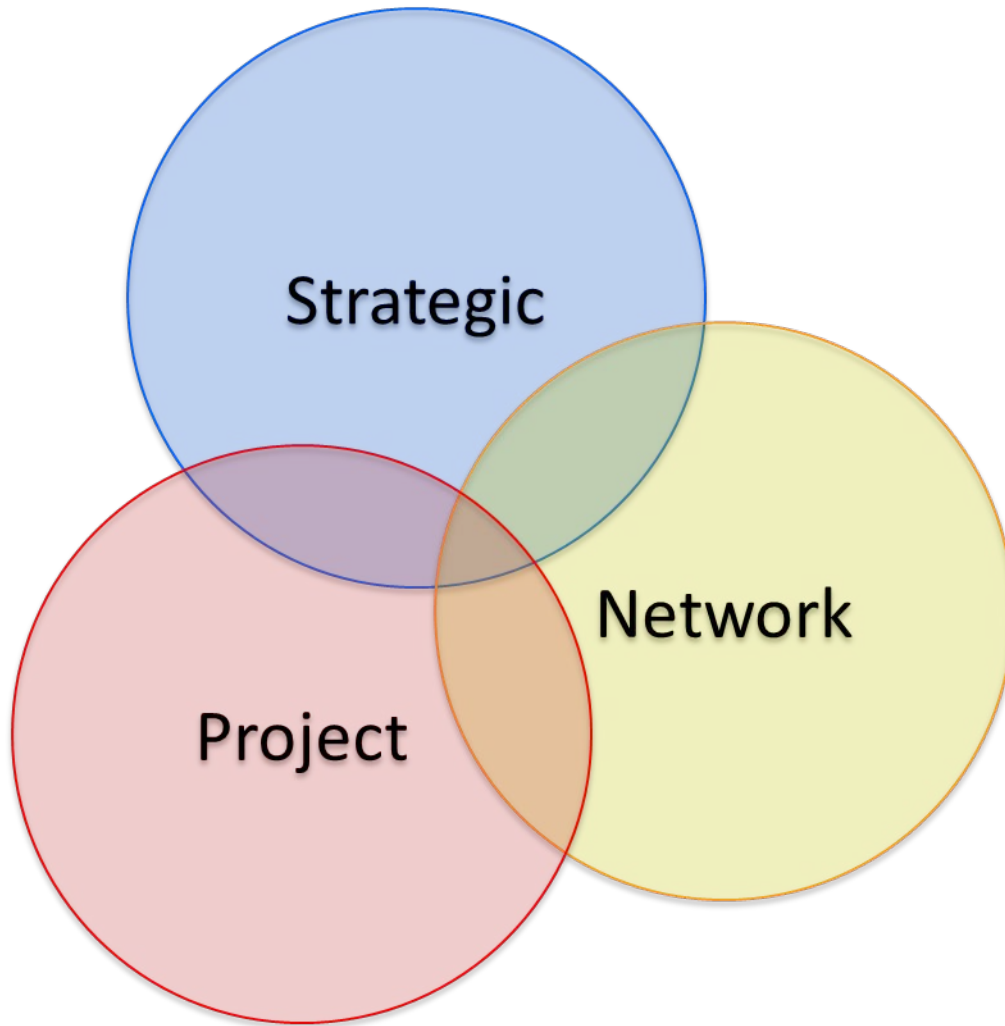
Considerations in Data Visualization

- Horizontal Scale
- Vertical Scale
- Color
- Color Intensity
- Text or symbolization
- Data Density

Considerations in Software Development

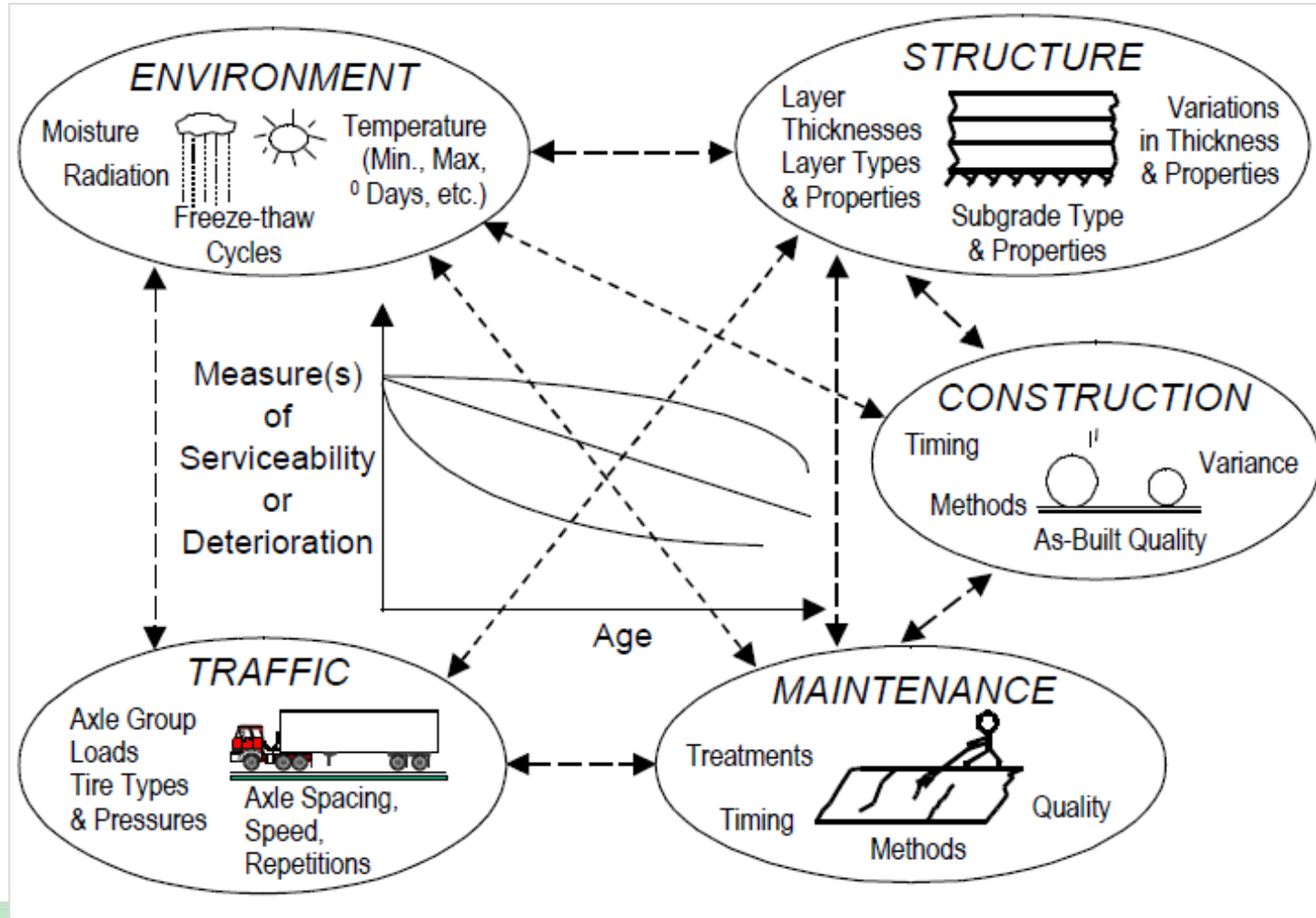
- Code Reusability (Templates)
 - How many different pieces of data fit this particular visualization?
- User Experience (Interaction)
 - What is an intuitive way to interact with the visualization?

Pavement Management Decision Levels



- Strategic: Broad based decisions, low level of detail
- Network: Moderate level of detail and breadth of decisions
- Project: High level of detail with focus
- Decisions at all levels are synergistic

Data Complexity for Pavements



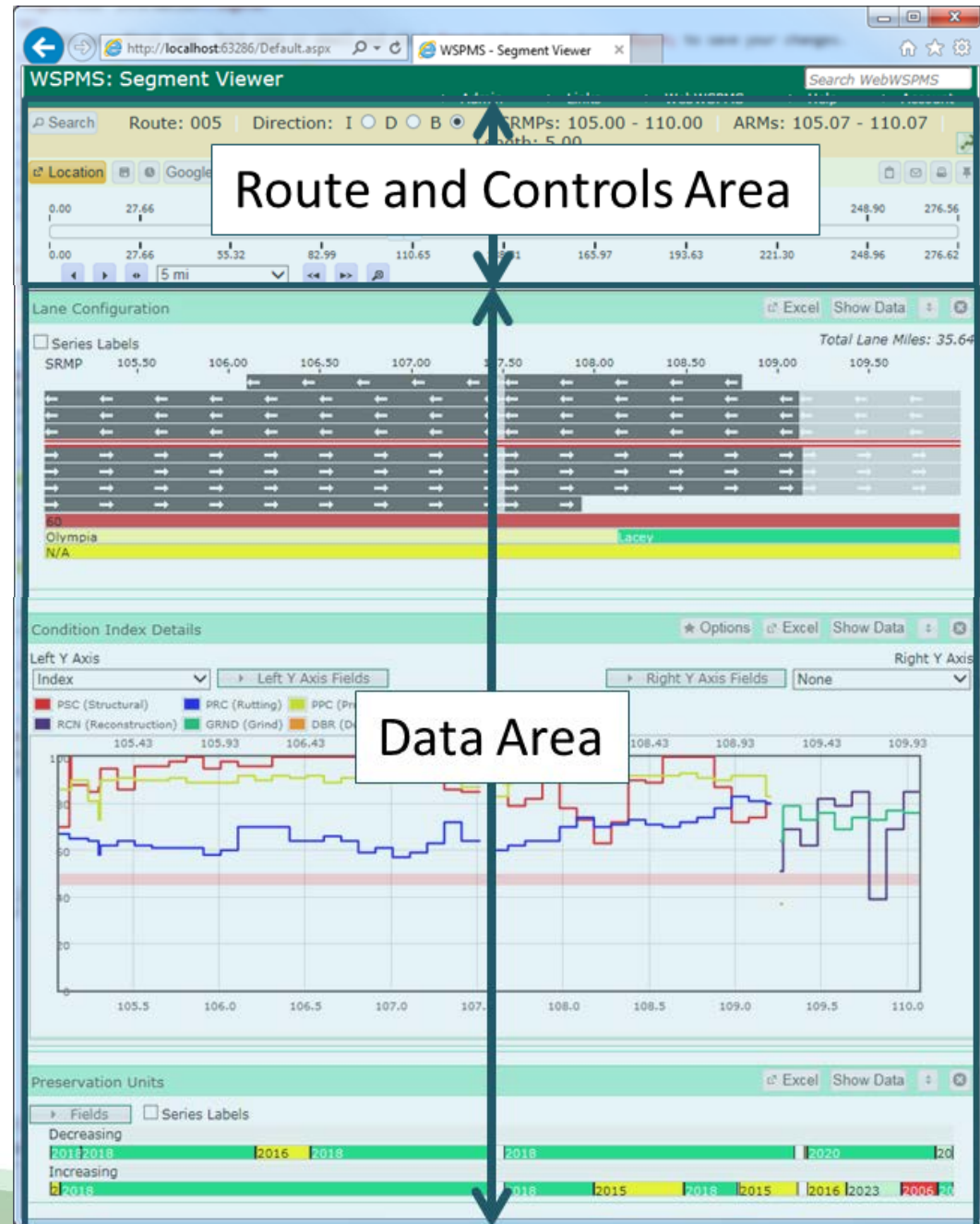
Factors affecting pavement performance (after Haas 2001)

Data Complexity in Pavement Management



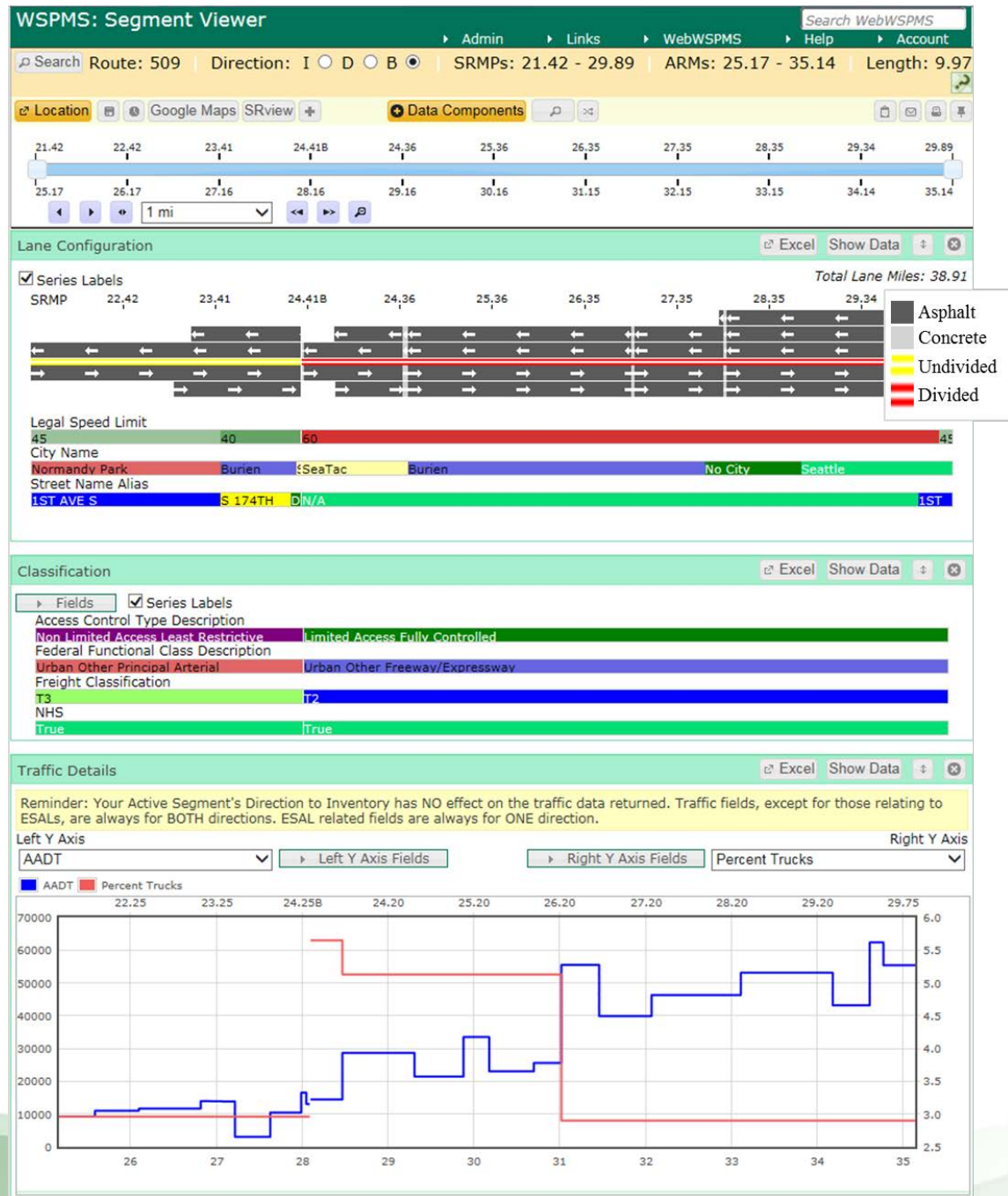
Segment Viewer

- Interactive Straight Line Diagram
- Pick *any* segment of State Route
- Choose from over 40+ Data Components to stack vertically and compare
- Draw a straight line down to compare data at the same location



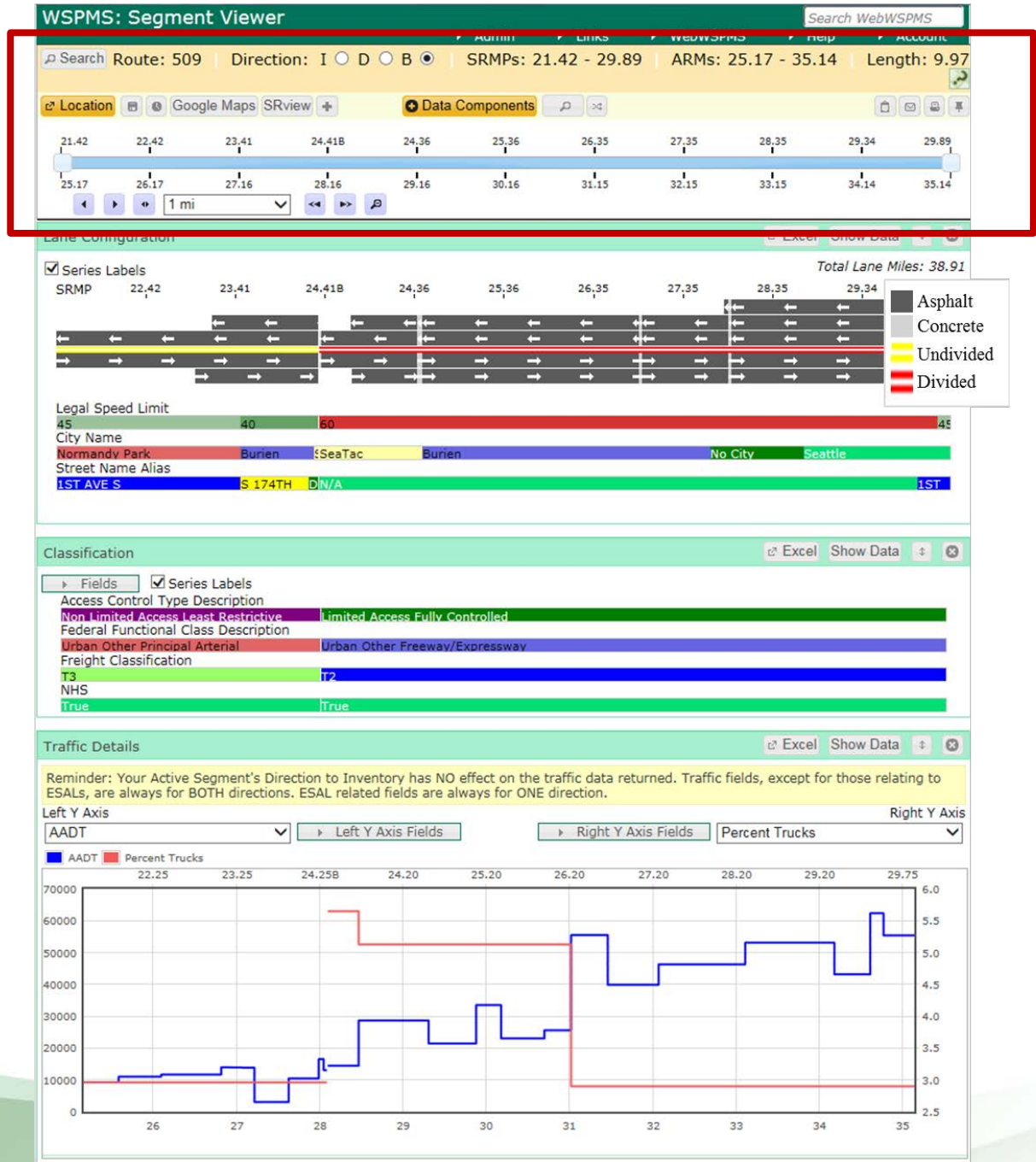
Segment Viewer Examples

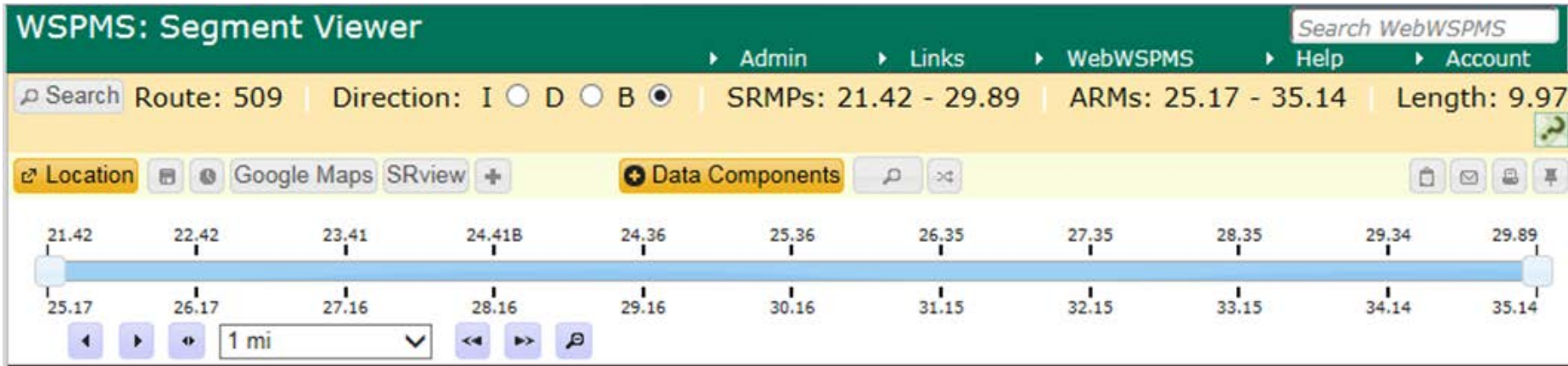
Segment Scope



Segment Viewer Examples

Segment Scope

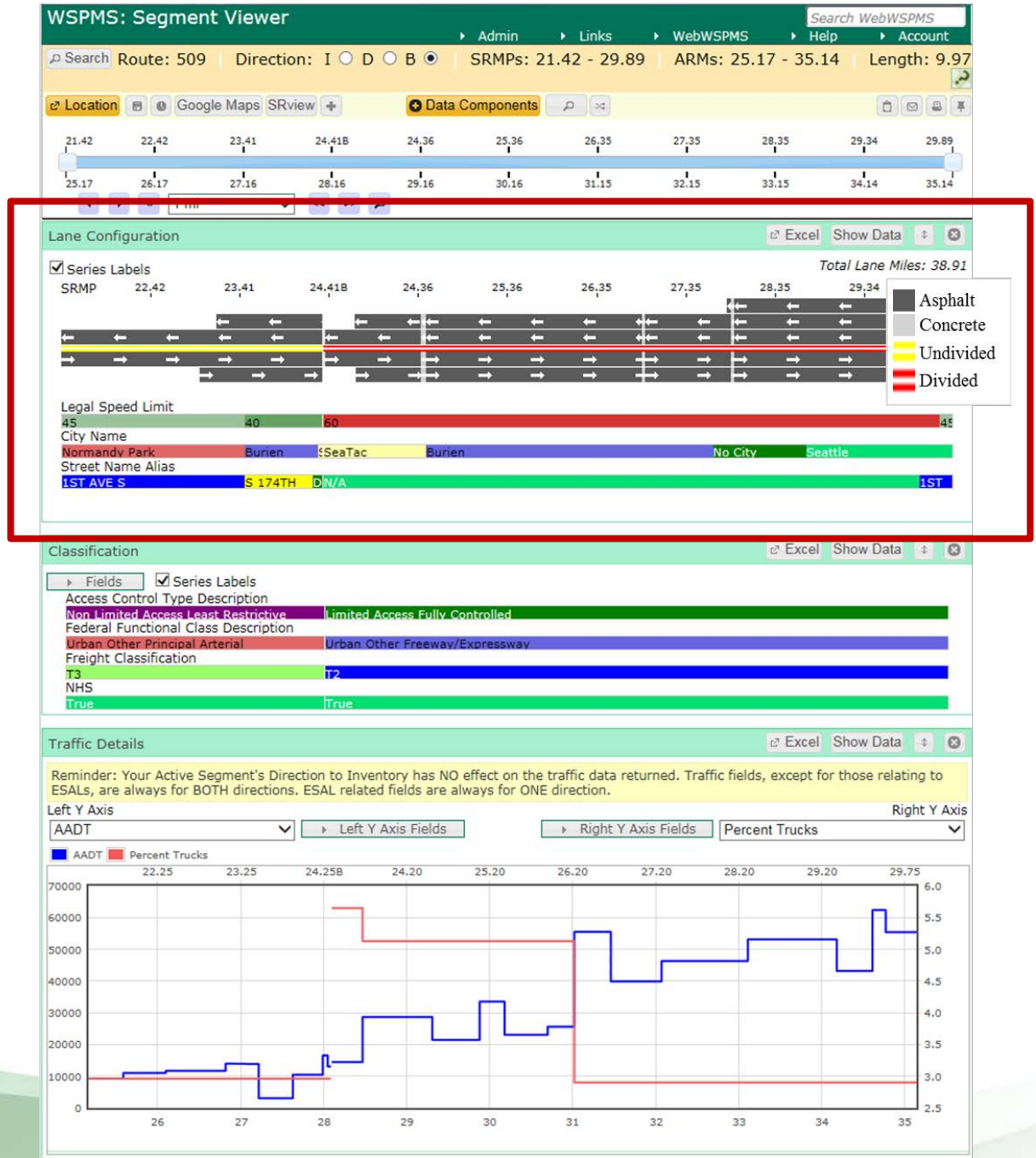


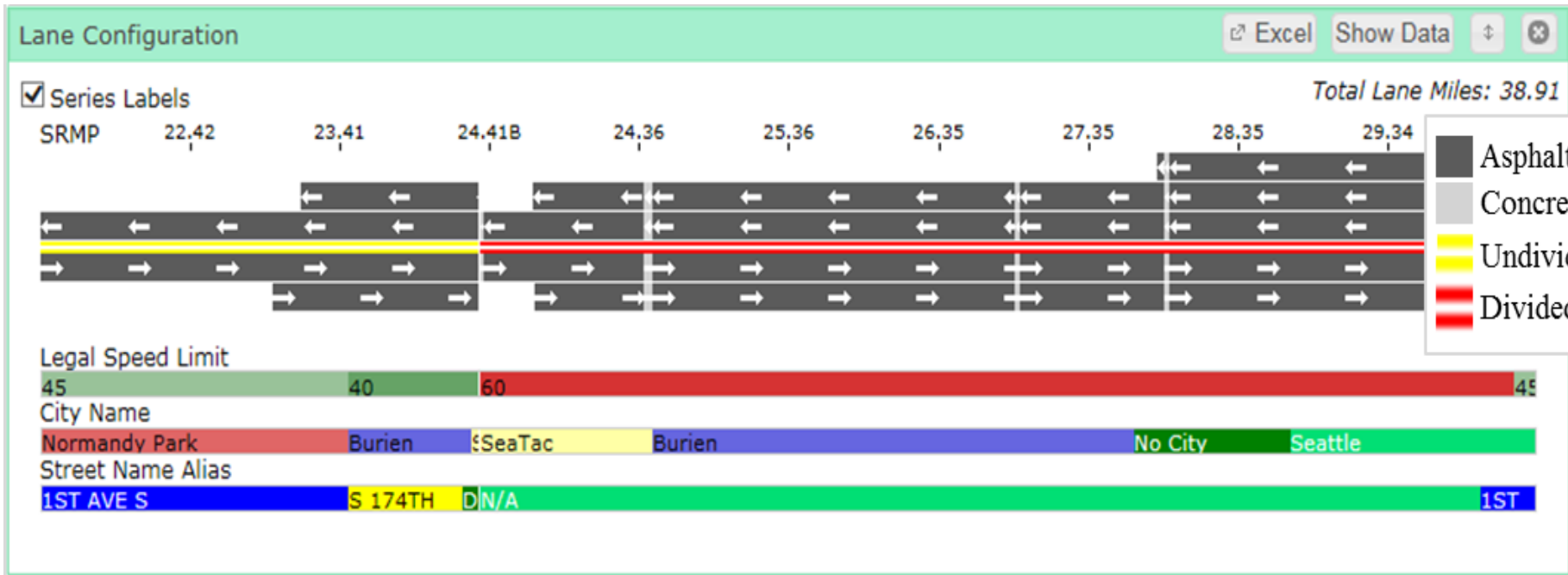


- SR 509 Milepost 21.42 to Milepost 29.89
- Total Length
- Slider Allows for Quick Limit Changes on Same Route
- Slider serves as reference scale
- Other Controls

Segment Viewer Examples

Segment Scope



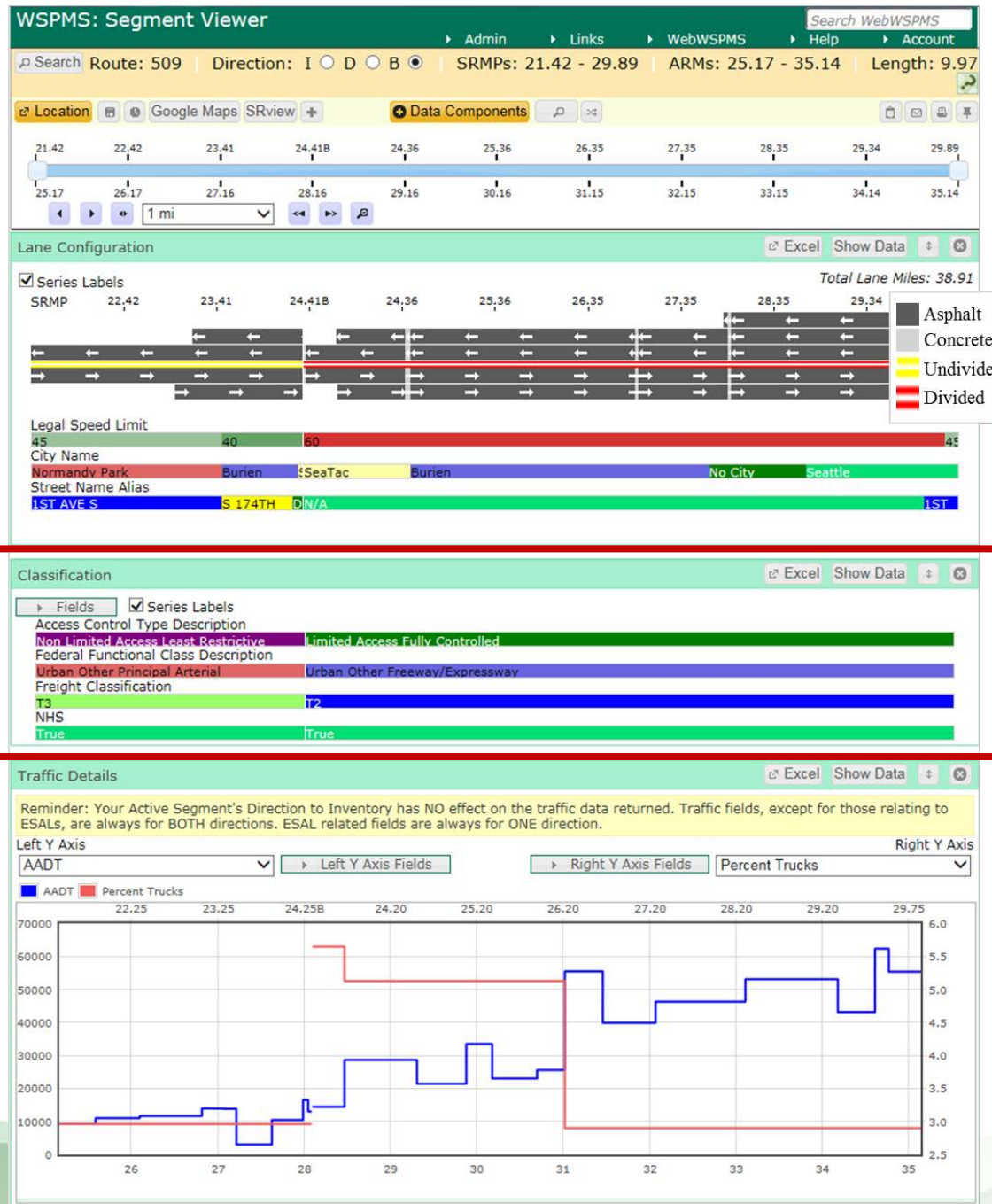


- Number and Type of Lanes
- Changes in Configuration (Number of Lanes, Divided/Undivided)
- Total Lane Miles

- Surface Type
- City Limits
- Speed Limit

Segment Viewer Examples

Segment Scope



Classification

Excel Show Data

Fields

Series Labels

Access Control Type Description

Non Limited Access Least Restrictive | Limited Access Fully Controlled

Federal Functional Class Description

Urban Other Principal Arterial | Urban Other Freeway/Expressway

Freight Classification

T3 | T2

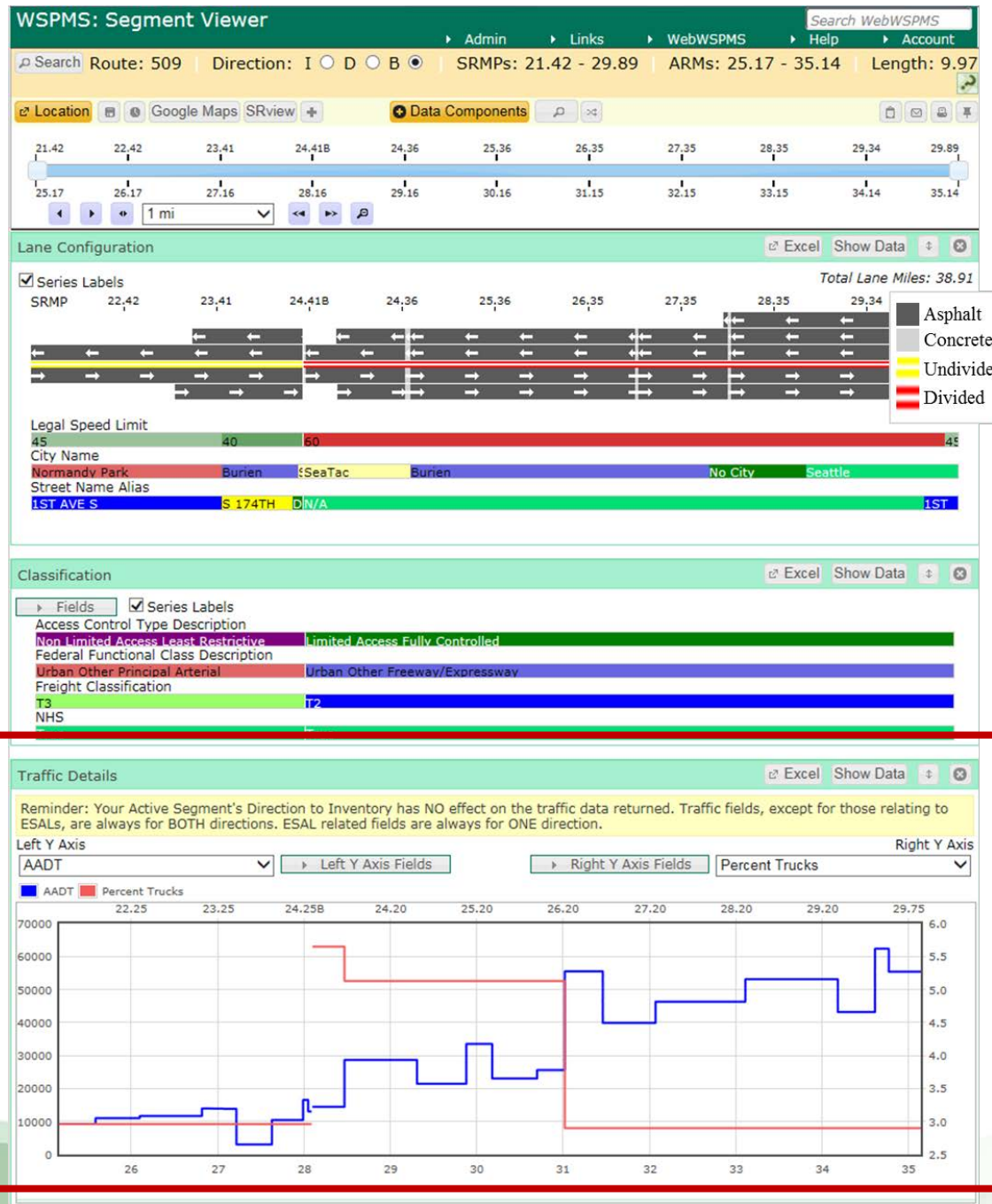
NHS

True | True

- Access Control
- Functional Class
- Freight Classification
- NHS Status

Segment Viewer Examples

Segment Scope

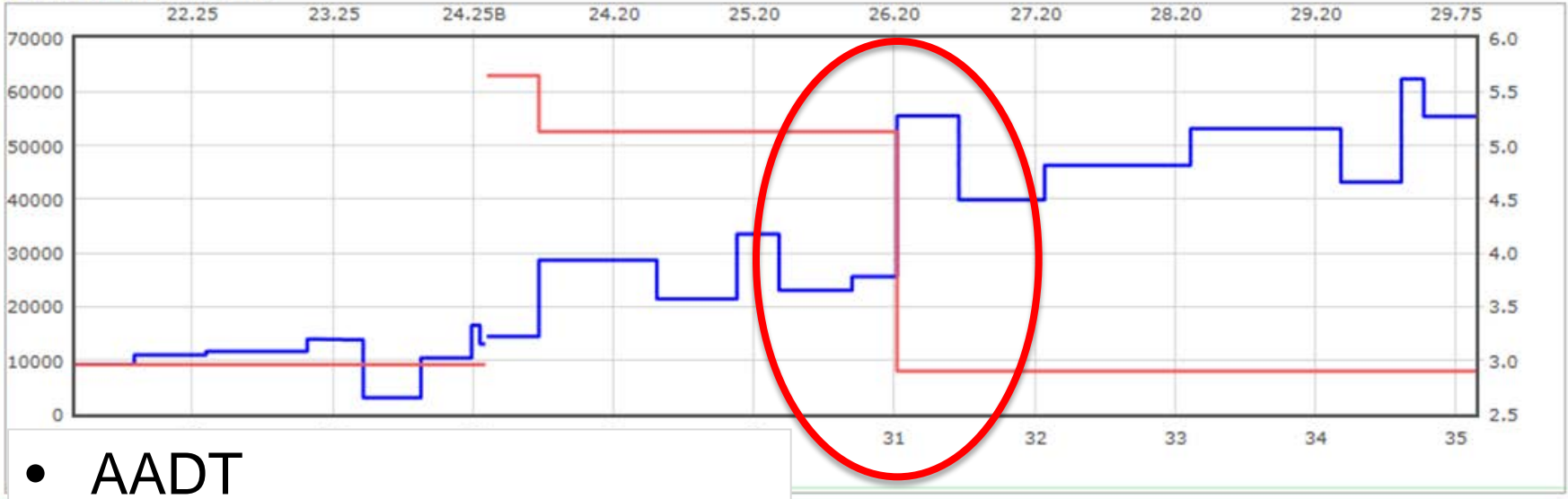


Reminder: Your Active Segment's Direction to Inventory has NO effect on the traffic data returned. Traffic fields, except for those relating to ESALs, are always for BOTH directions. ESAL related fields are always for ONE direction.

Left Y Axis

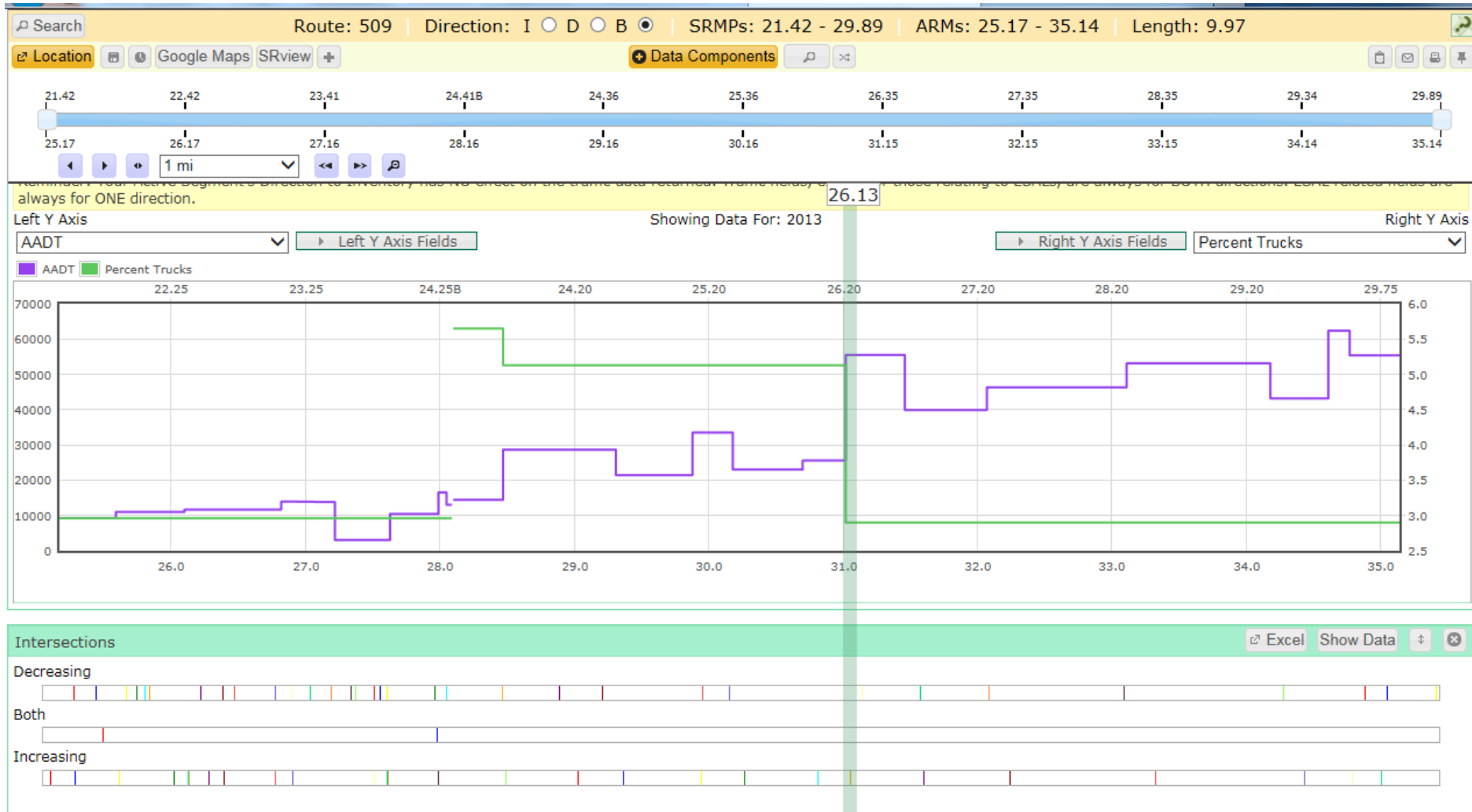
AADT Percent Trucks

■ AADT ■ Percent Trucks

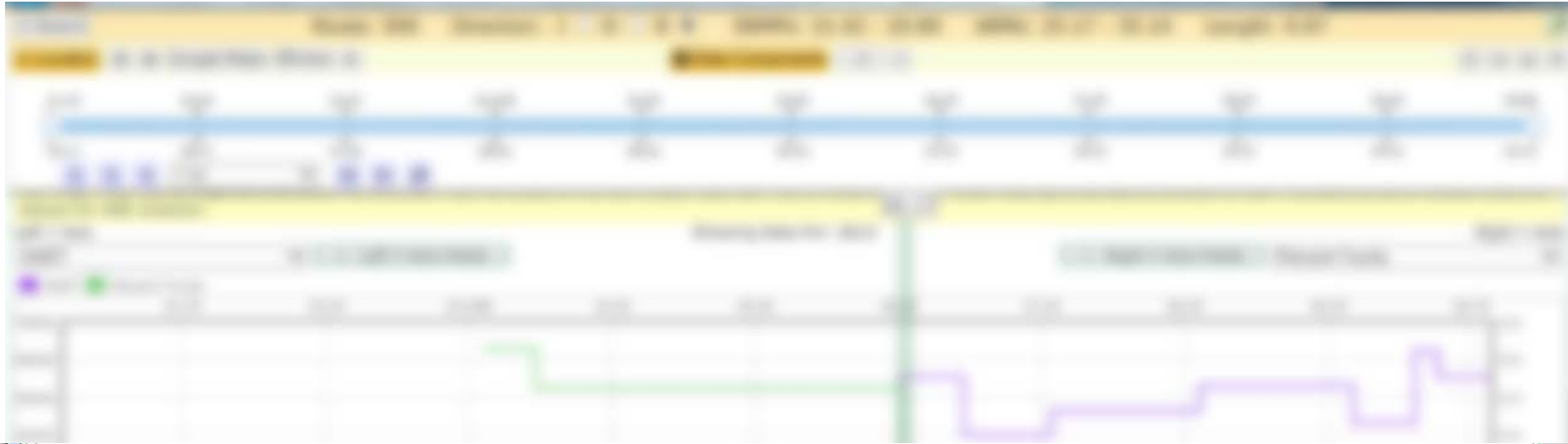


- AADT
- Percent Trucks
- Annual ESALs

Why the large change in AADT?

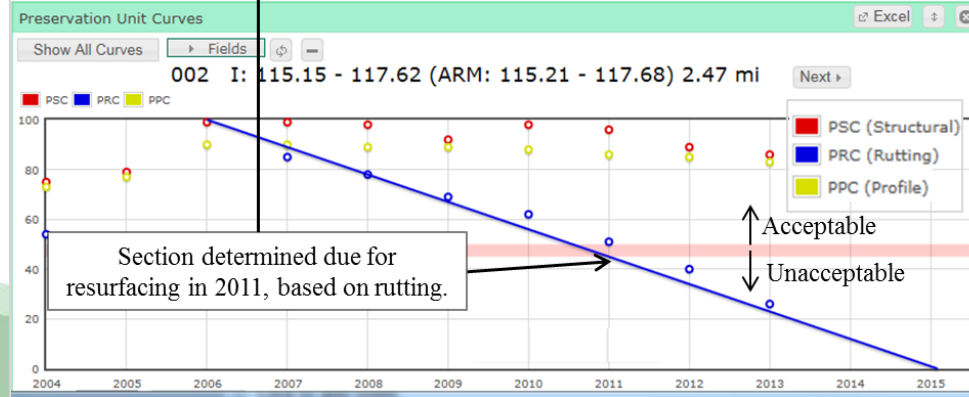
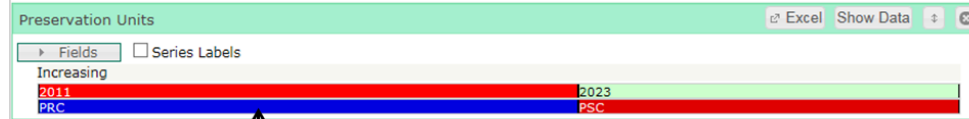
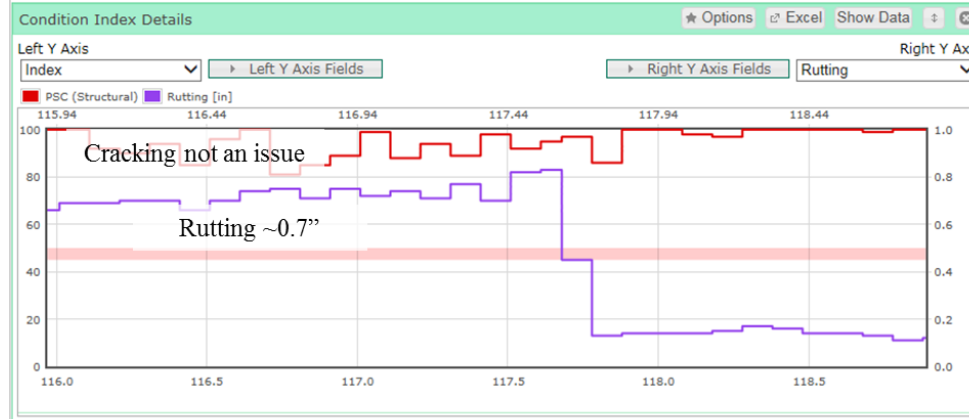
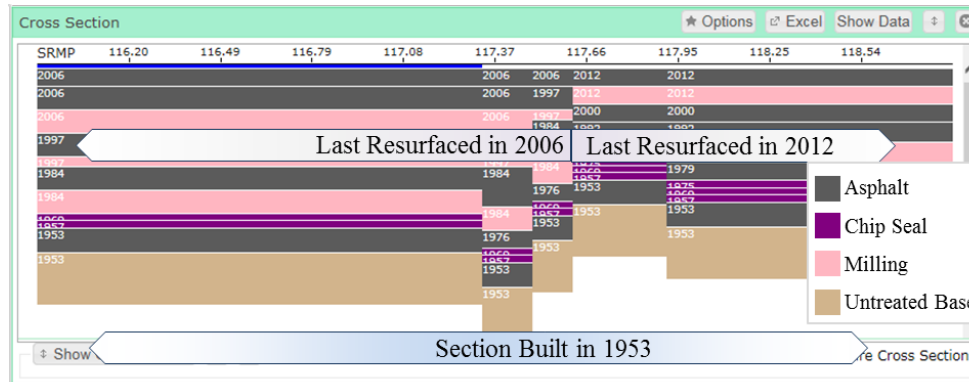


Why the large change in AADT?

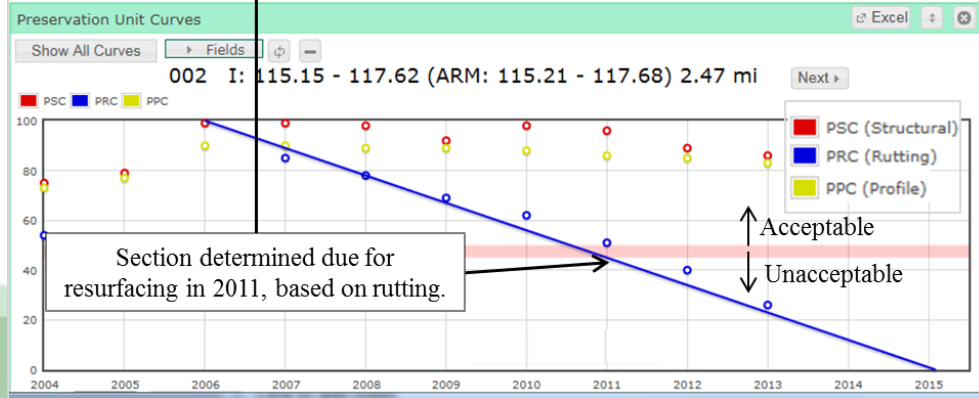
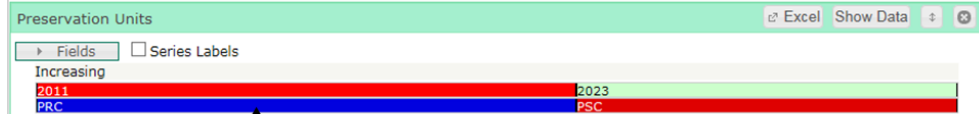
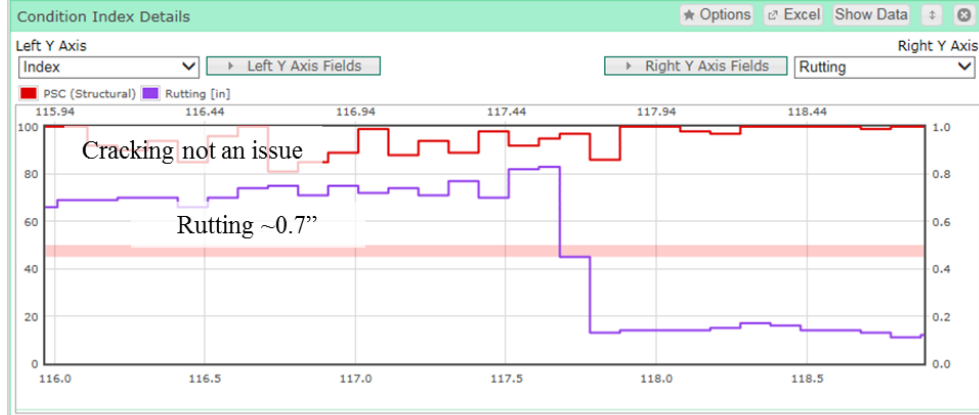
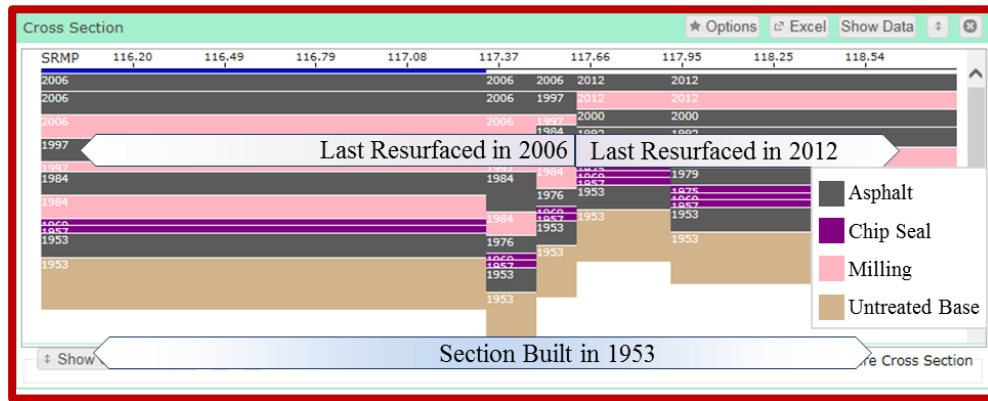


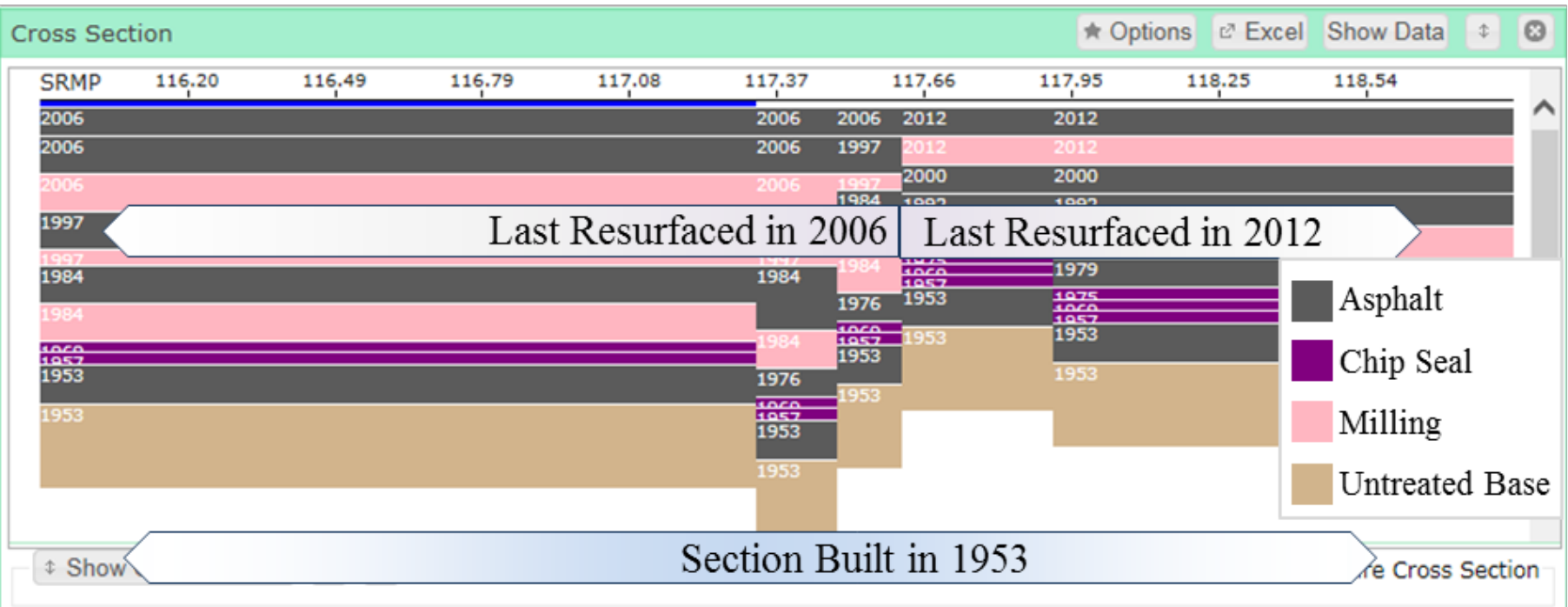
Intersections	Left Right Indicator: R	Excel Show Data <input type="button" value="↓"/> <input type="button" value="✖"/>
Decreasing	Description: SR 518	
<input type="checkbox"/>	Configuration Type Code: A	
<input type="checkbox"/>	Configuration Type Description: ON RAMP	
<input type="checkbox"/>	Traffic Control Type Code: NO	
Both	Traffic Control Type Description: NO TRAFFIC SIGNAL	
<input type="checkbox"/>	SRMP: 26.13	
Increasing	ARM: 30.93	
<input type="checkbox"/>		

Segment Viewer Examples Condition and History



Segment Viewer Examples Condition and History

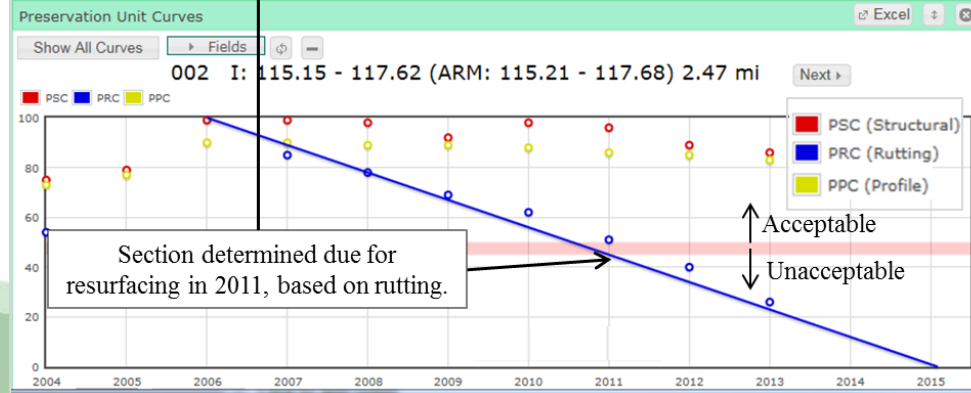
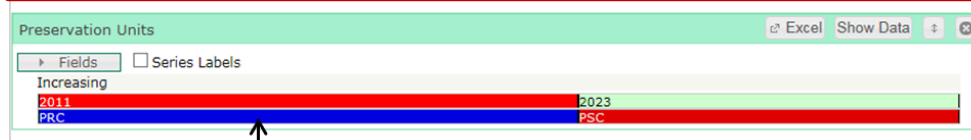
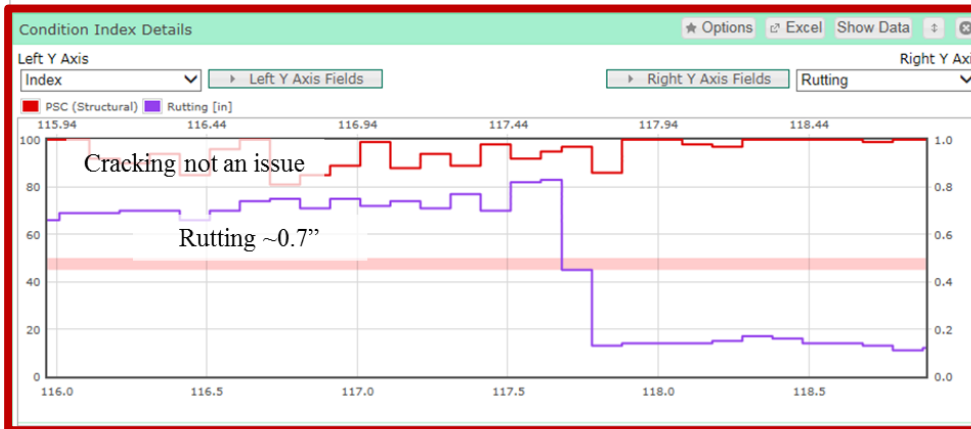
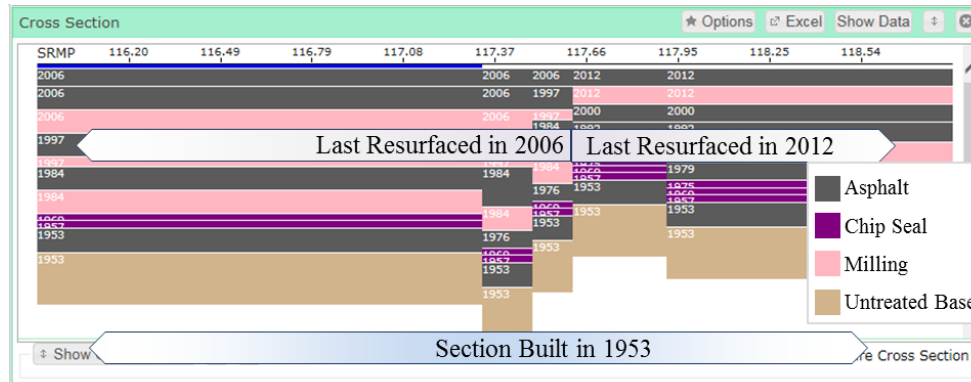


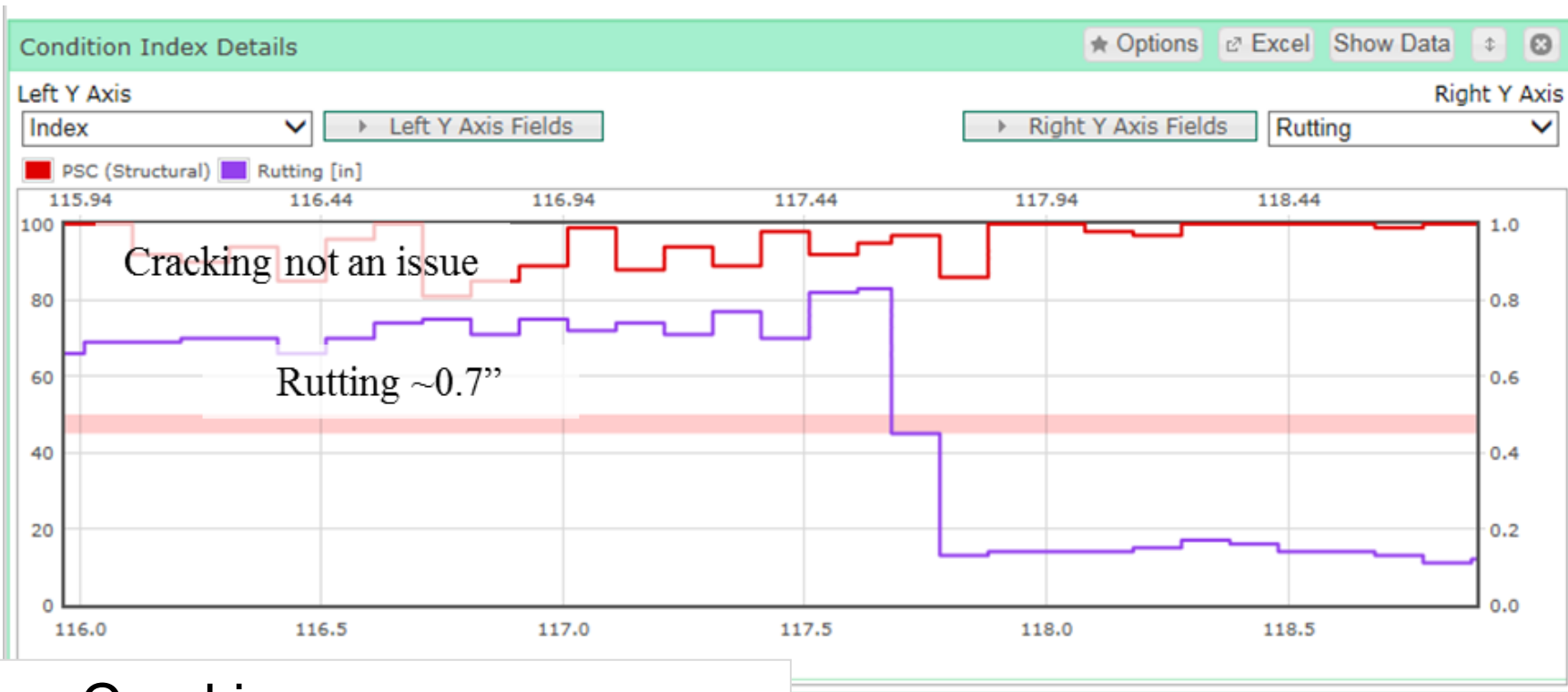


- Material Type
- Year of Work
- Vertically Scaled to Thickness
- Click for Details

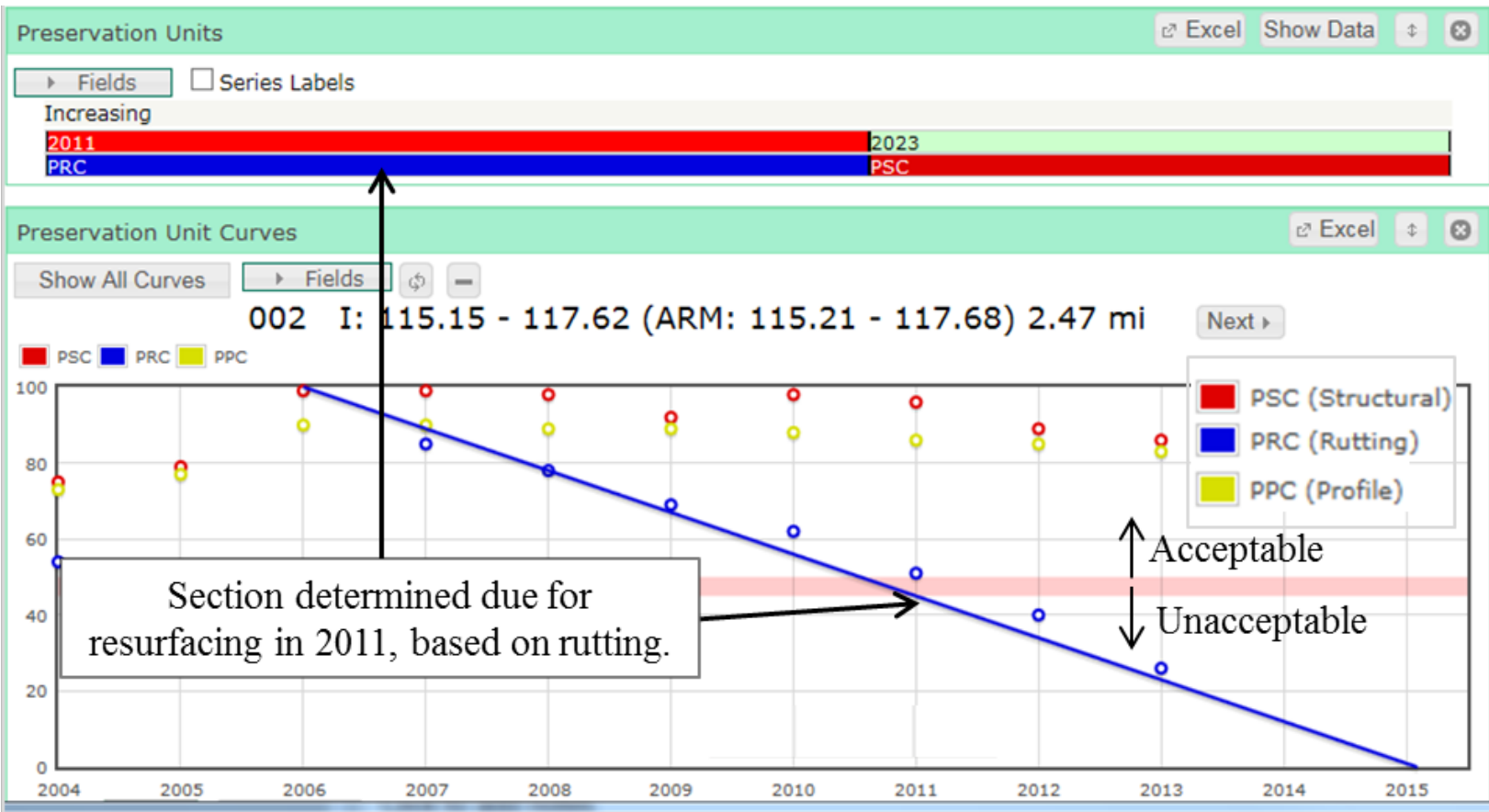
Segment Viewer Examples

Condition and History



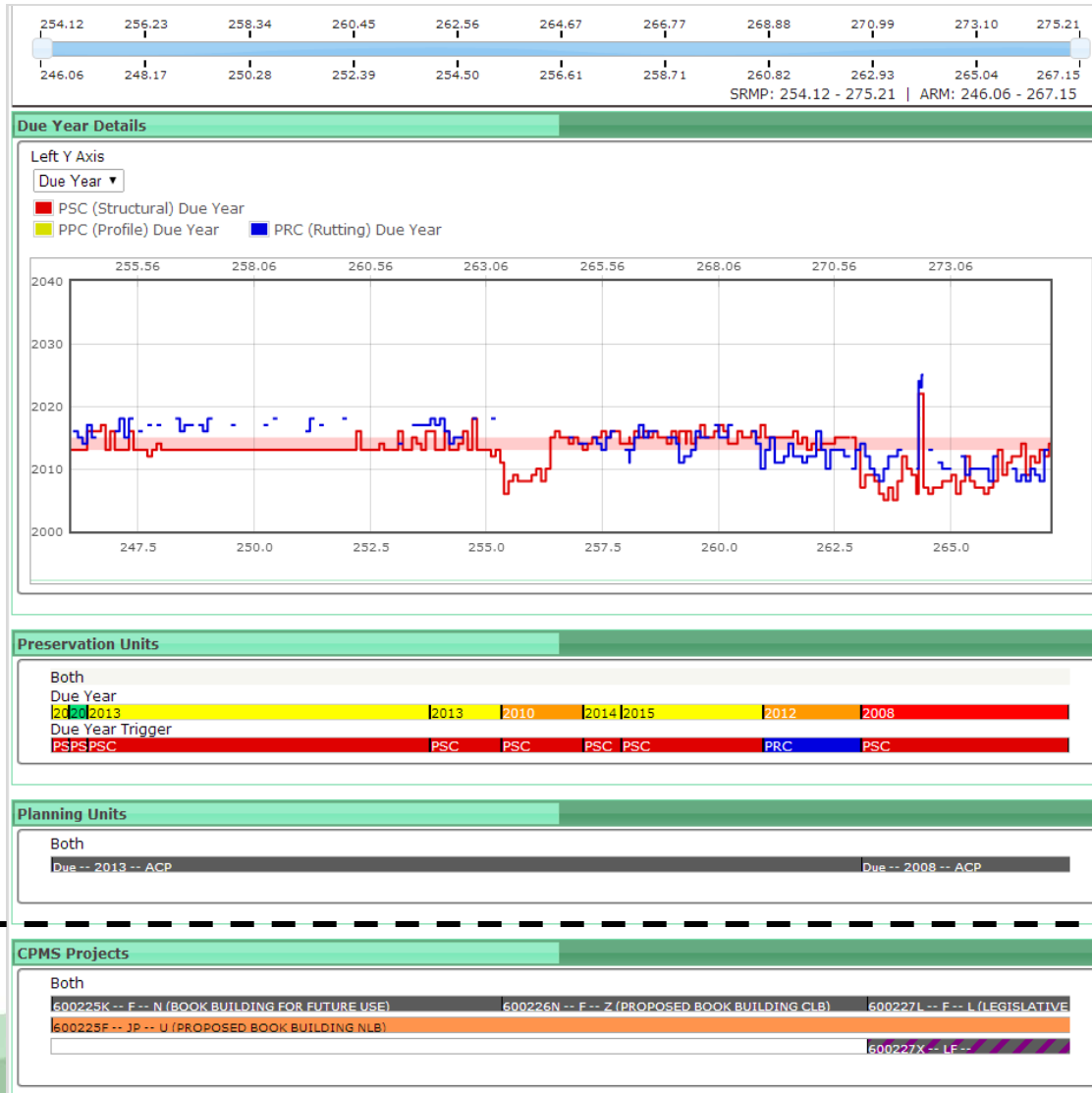


- Cracking
- Rutting
- Roughness
- Indexes
- Due Years



Segment Viewer Examples

Project Definition



Progression from:

Survey Unit (0.1 mile)

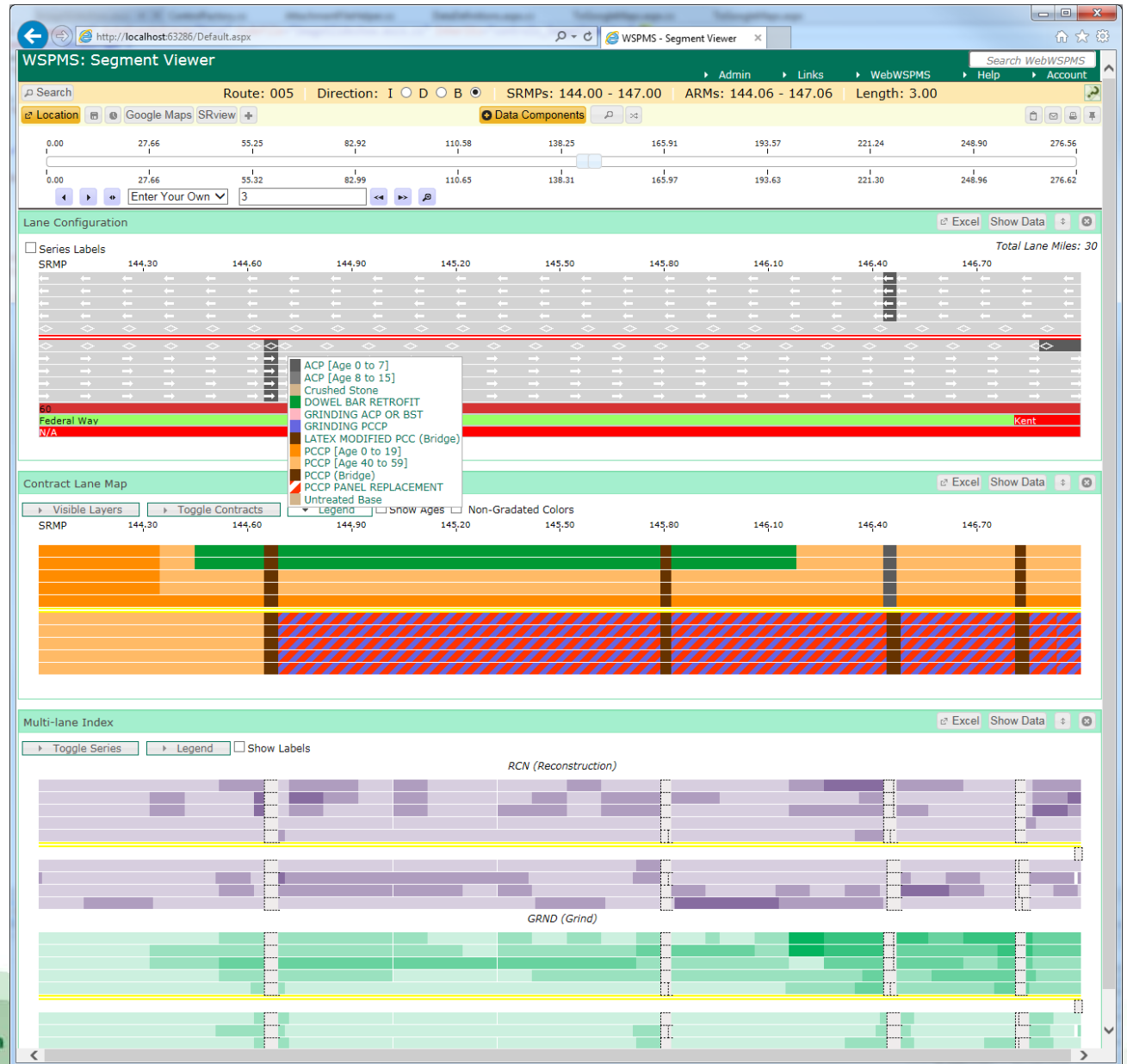
to Preservation Unit (~1 mile)

to Planning Unit (~2 miles)

to Pavement Preservation Project

Segment Viewer Examples

Multi Lane Data



Segment Viewer on a Mobile Platform

The screenshot displays the WSPMS - Segment Viewer mobile application interface. At the top, the status bar shows Verizon, VPN, 1:25 PM, and 50% battery. The browser address bar contains 'mlb4487042'. The main header reads 'WSPMS - Segment Viewer'. Below this, a yellow bar displays 'ARMs: 15.00 - 25.00' and 'Length: 10.00'. A toolbar includes 'Location', 'Google Maps', 'GPS', and 'Data Components'. A data table shows columns for '20,25', '21,25', '22,25', '23,27', and '24,27'. Below the table is a 'Preservation Units' section with 'Fields' and 'Series Labels' tabs, and a 'Condition Index Details' section with 'Left Y Axis' and 'Right Y Axis' dropdowns. The bottom chart shows three data series: PSC (Structural) in red, PRC (Rutting) in blue, and PPC (Profile) in yellow, plotted against a horizontal axis from 14.99 to 25.27 and a vertical axis from 20 to 100. A vertical green line is positioned at approximately 15.00. Four callout boxes with arrows point to specific features: 'Save Comments and Photos' points to the top right; 'Sync to GPS Location' points to the 'GPS' button; 'Track GPS' points to the 'GPS' button; and 'Straight Line Updates with GPS' points to the vertical green line.

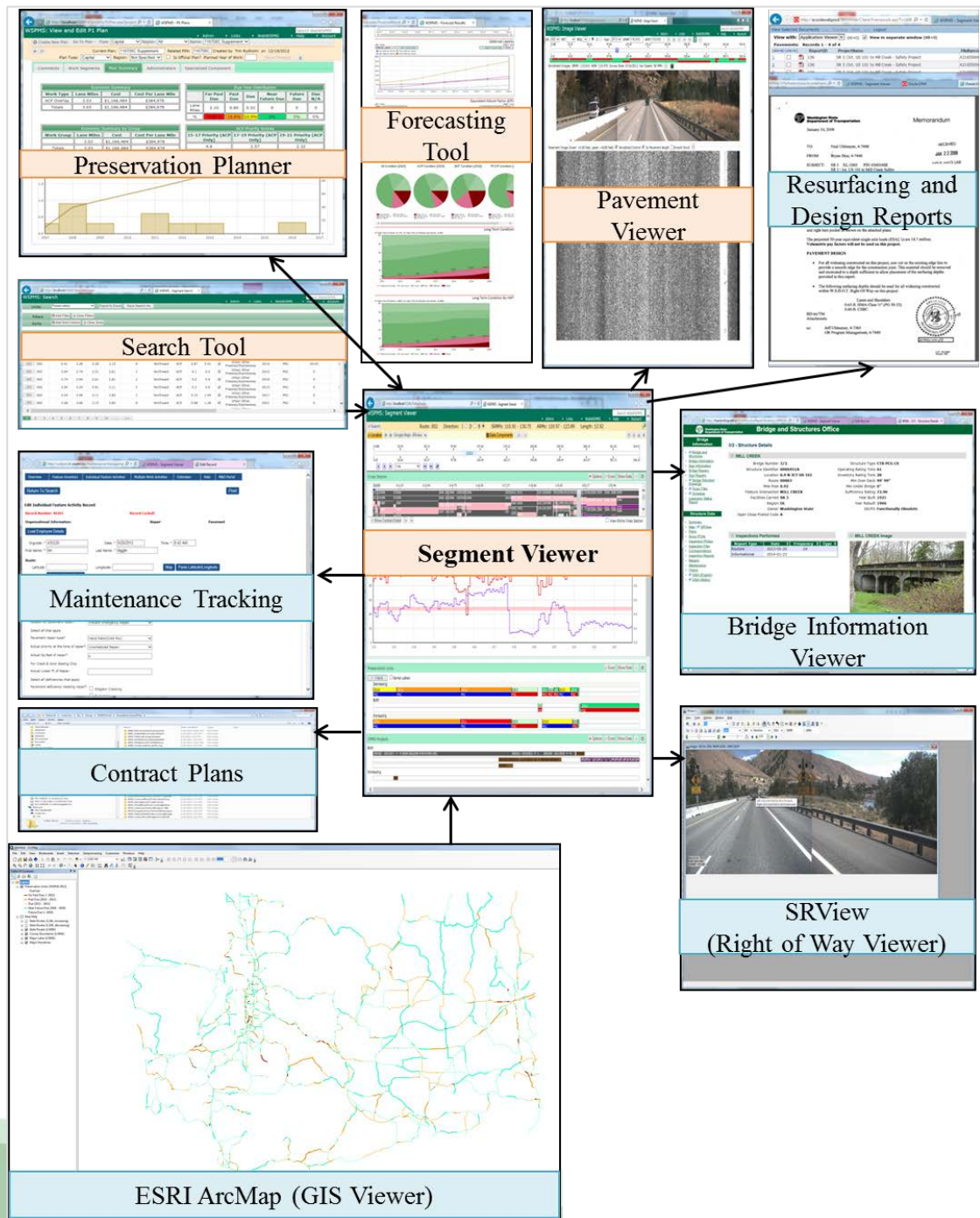
Save Comments and Photos

Sync to GPS Location

Track GPS

Straight Line Updates with GPS

Part of a Robust Pavement Management Toolbox



Questions?

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